

184
PERIODICAL
UNIVERSITY OF HAWAII
LIBRARY

CRYOGENICS

An International Journal of Low
Temperature Engineering and Research

VOLUME 2

SEPTEMBER 1961 TO DECEMBER 1962

EDITORS

Great Britain: K. Mendelssohn
U.S.A.: R. B. Scott
France: L. Weil

Reprinted 1964 for

Wm. DAWSON & SONS Ltd., London

with the permission of

Heywood & Company Ltd.

printed in Belgium

TP480
C75
v. 2

CRYOGENICS

**An International Journal of Low
Temperature Engineering and Research**

VOLUME 2

SEPTEMBER 1961 TO DECEMBER 1962

EDITORS

Great Britain: K. Mendelssohn

U.S.A.: R. B. Scott

France: L. Weil

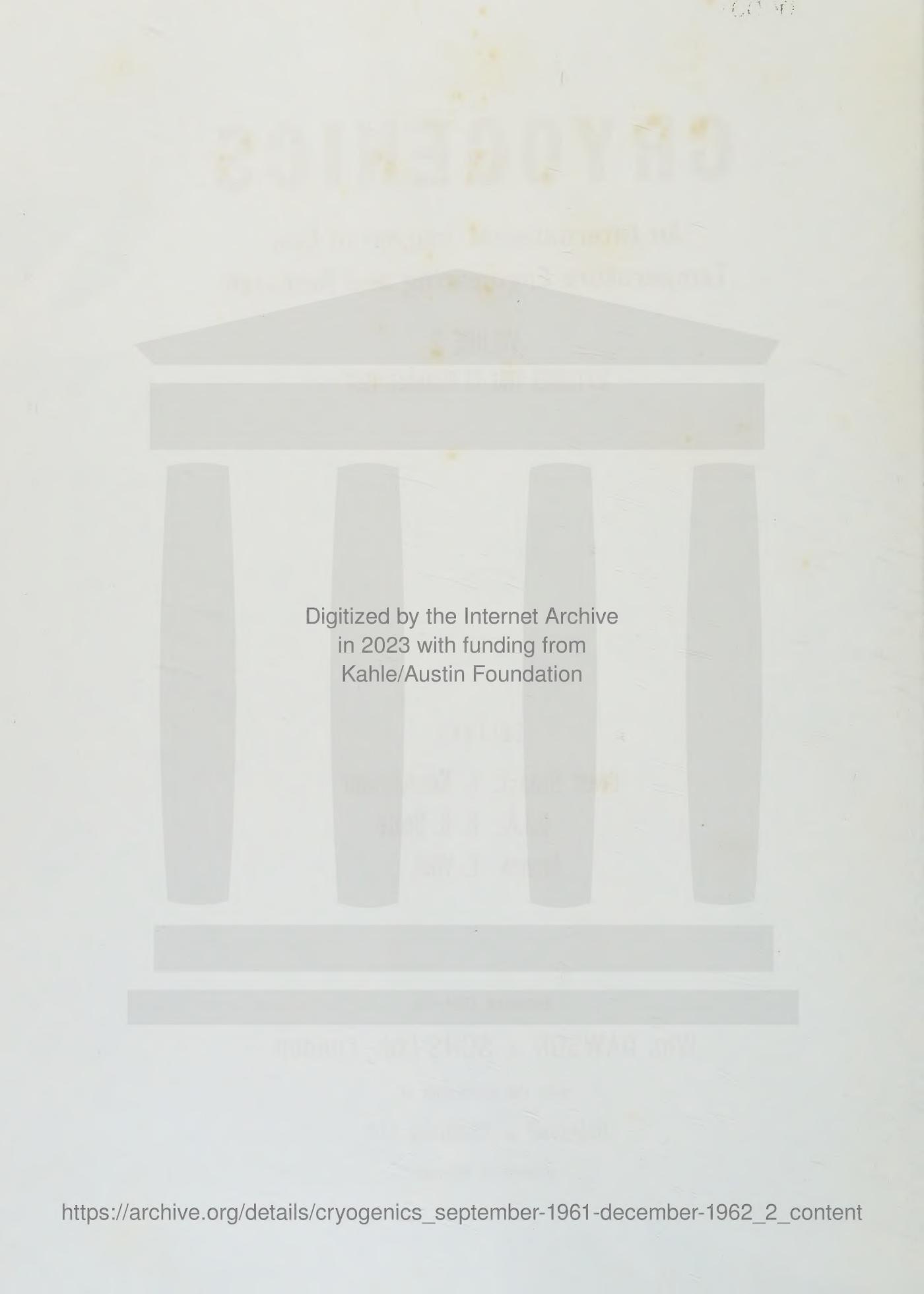
Reprinted 1964 for

Wm. DAWSON & SONS Ltd., London

with the permission of

Heywood & Company Ltd.

printed in Belgium



Digitized by the Internet Archive
in 2023 with funding from
Kahle/Austin Foundation

5856-14

Classified List of Contents

<i>Andres, K.</i> The measurement of thermal expansion of metals at low temperatures	93
<i>Apparatus for obtaining temperatures down to 0·3° K by using helium-3, an: B. N. Esel'son, A. D. Shvets, and N. G. Bereznyak</i>	361
<i>Arp, V., and Kropschot, R. H.</i> Superconducting magnets	1
—, <i>Wilson, J. H., Winrich, L., and Sikora, P.</i> Thermal expansion of some engineering materials from 20 to 293° K	230
<i>Babenko, V. P., Brodin, M. S., and Soskin, M. S.</i> A cryostat for dispersion measurements at low temperatures	365
<i>Baltensperger, W., Olsen, J. L., Daunt, J. G., and Kreitman, M.</i> The variation of critical current in superconducting alloys with field direction	212
<i>Bereznyak, N. G., Esel'son, B. N., and Shvets, A. D.</i> An apparatus for obtaining temperatures down to 0·3° K by using helium-3	361
<i>Bewilogua, L.</i> Continuously working plant for the separation of neon-helium mixtures	290
— and <i>Knöner, R.</i> The thermosiphon as a nitrogen cryostat for operation in the horizontal reactor channel	46
— and <i>Reichel, J.</i> Studies on desorption cryostats	180
<i>Bhadagat, S. M., and Critchlow, P. R.</i> Thermomechanical pressure measurements in liquid helium-II	39
— and <i>Mendelsohn, K.</i> Isothermal flow of liquid helium-II in wide capillaries	34
<i>Biermans, F., and Nihoul, J.</i> A simple and continuous level indicator for liquefied gases	243
<i>Bohm, H. V., Zimmerman, J. E., and McNutt, J. D.</i> A magnetic refrigerator employing superconducting solenoids	153
<i>Brodin, M. S., Soskin, M. S., and Babenko, V. P.</i> A cryostat for dispersion measurements at low temperatures	365
<i>Buchhold, T. A., and Molenda, P. J.</i> Surface electrical losses of superconductors in low frequency fields	344
<i>Buyanov, R. A., Zel'dovich, A. G., and Pilipenko, Yu. K.</i> A liquefier for producing para-hydrogen and catalysts for the ortho-para conversion of hydrogen	143
<i>Cadmium isotopes, superconductivity of:</i> <i>J. L. Olsen</i>	356
<i>Calverley, A., Mendelsohn, K., and Rowell, P. M.</i> Some thermal and magnetic properties of tantalum, niobium, and vanadium at helium temperatures	26
<i>Carbon resistance thermometers for low temperatures:</i> <i>N. N. Mikhailov and A. Ya. Kaganovskii</i>	98
<i>Carruthers, J. A., Cochran, J. F., and Mendelsohn, K.</i> Thermal conductivity of P-type germanium between 0·2° and 4° K	160
<i>Challis, L. J.</i> The calculation of temperature differences from resistance thermometer measurements using a digital computer	23
<i>Chen, C. Y., Daunt, J. G., and Pandorf, R. C.</i> Heat transport through carbon radio resistors at low temperatures and their use in conjunction with superconducting thermal valves	239
<i>Chopra, K. L.</i> Liquid helium cryostat for X-ray diffraction studies	167
<i>Cochran, J. F., Mendelsohn, K., and Carruthers, J. A.</i> Thermal conductivity of P-type germanium between 0·2° and 4° K	160
<i>Collins, S. C., and Hughes R. W.</i> New refrigeration cycle for the production of liquid nitrogen	43
Concentration of oxygen in nitrogen cryostats for reactor irradiations, the: <i>L. Heyne</i>	332
<i>Critchlow, P. R., and Bhagat, S. M.</i> Thermomechanical pressure measurements in liquid helium-II	39
<i>Crowe storage cell in the coincident current mode, tolerances associated with the operation of the:</i> <i>R. V. Peacock</i>	88
<i>Cryochemistry: H. A. McGee, Jr., and W. J. Martin</i>	257
<i>Cryogenics, current trends and prospects in:</i> <i>R. B. Stewart, R. V. Smith, and T. R. Strobridge</i>	321
<i>Curzon, A. E.</i> A study of the orientation of thin films of tin on single crystal substrates	334
<i>Daunt, J. G., Kreitman, M., Baltensperger, W., and Olsen, J. L.</i> The variation of critical current in superconducting alloys with field direction	212
<i>Daunt, J. G., Pandorf, R. C., and Chen, C. Y.</i> Heat transport through carbon radio resistors at low temperatures and their use in conjunction with superconducting thermal valves	239
Desorption cryostats, studies on: <i>L. Bewilogua and J. Reichel</i>	180
<i>Diller, D. E., Roder, H. M., Goodwin, R. D., and Weber, L. A.</i> The vapour pressure of 20° K equilibrium hydrogen	236
—, <i>Roder, H. M., Weber, L. A., and Goodwin, R. D.</i> The densities of saturated liquid hydrogen	81
— and <i>Younglove, B. A.</i> The specific heat at constant volume of para-hydrogen at temperatures from 15 to 90° K and pressures to 340 atm	348
— and <i>Younglove, B. A.</i> The specific heat of saturated liquid para-hydrogen from 15 to 32° K	283
Dispersion measurements at low temperatures, a cryostat for: <i>V. P. Babenko, M. S. Brodin, and M. S. Soskin</i>	365
<i>Donth, E., and Gladun, C.</i> Measurement of thermal conductivity at low temperatures by a non-stationary method	223
<i>Dugdale, J. S., and Gugan, D.</i> The effect of the martensitic transformation on the electrical resistance of lithium and dilute lithium-magnesium alloys	103

<i>Edeskuty, F. J., and Hammel, E. F.</i> Cryogenic engineering in nuclear rocketry	193
Electrical resistance of aluminium at low temperatures: <i>A. Maimoni</i>	217
Electromagnet with superconducting windings, an: <i>I. N. Goncharov, I. I. Gromova, B. S. Neganov, and L. B. Parfenov</i>	363
<i>Esel'son, B. N., Lazarev, B. G., and Shvets, A. D.</i> The production of temperatures below 1°K by pumping liquid helium vapour using adsorption pumps	279
—, <i>Shvets, A. D., and Bereznyak, N. G.</i> An apparatus for obtaining temperatures down to 0.3°K by using helium-3	361
<i>Filimonov, A. I., and Tkachenko, V. K.</i> A gasifier for obtaining pressures up to 100 atm using liquid helium	359
<i>Fradkov, A. B.</i> Helium and hydrogen cryostats without additional liquid nitrogen cooling	177
<i>Galkin, A. A., and Korolyuk, A. P.</i> An apparatus for studying ultrasonic absorption in metals at low temperatures	48
<i>Gannus, V. K., and Roizen, L. I.</i> An automatic arrangement for supplying a space with liquid nitrogen	145
Gasifier for obtaining pressures up to 100 atm using liquid helium, a: <i>V. K. Tkachenko and A. I. Filimonov</i>	359
<i>Genkin, Ya. E., Khotkevich, V. I., and Pervakov, V. A.</i> A low temperature press	281
<i>Gladun, C., and Donth, E.</i> Measurement of thermal conductivity at low temperatures by a non-stationary method	223
<i>Goncharov, I. N., Gromova, I. I., Neganov, B. S., and Parfenov, L. B.</i> An electromagnet with superconducting windings	363
<i>Goodwin, R. D.</i> Melting pressure equation for the hydrogens	353
—, <i>Diller, D. E., Roder, H. M., and Weber, L. A.</i> The densities of saturated liquid hydrogen	81
—, <i>Weber, L. A., Diller, D. E., and Roder, H. M.</i> The vapour pressure of 20°K equilibrium hydrogen	236
<i>Grilly, E. R.</i> The vapour pressure of solid and liquid neon	226
<i>Gromova, I. I., Neganov, B. S., Parfenov, L. B., and Goncharov, I. N.</i> An electromagnet with superconducting windings	363
<i>Gugan, D., and Dugdale, J. S.</i> The effect of the Martensitic transformation on the electrical resistance of lithium and dilute lithium-magnesium alloys	103
<i>Haenssler, F., and Rinderer, L.</i> Explosive boiling in nitrogen Dewars and nitrogen shielded helium Dewars	288
<i>Hammel, E. F., and Edeskuty, F. J.</i> Cryogenic engineering in nuclear rocketry	193
Heat capacity of condensed gases above their boiling point, a method for measuring the: <i>A. V. Voronel and P. G. Strelkov</i>	91
Heat transport through carbon radio resistors at low temperatures and their use in conjunction with superconducting thermal valves: <i>R. C. Pandorf, C. Y. Chen, and J. G. Daunt</i>	239
Helium and hydrogen cryostats without additional liquid nitrogen cooling: <i>A. B. Fradkov</i>	177
<i>Heyne, L.</i> The concentration of oxygen in nitrogen cryostats for reactor irradiations	332
<i>Hill, J. S., Meyér, H., and Milner, J. H.</i> Thermal and magnetic properties of nickel-zinc fluosilicate	170
<i>Hoare, F. E., and Yates, B.</i> Small scale hydrogen liquefaction	84
<i>Hughes, R. W., and Collins, S. C.</i> New refrigeration cycle for the production of liquid nitrogen	43
Hydrogen liquefaction, small scale: <i>B. Yates and F. E. Hoare</i>	84
— liquefier with an output of 50 l./hr of liquid hydrogen, a: <i>A. G. Zel'dovich and Yu. K. Pilipenko</i>	101
Isothermal flow of liquid helium-II in wide capillaries: <i>S. M. Bhagat and K. Mendelsohn</i>	34
<i>Itterbeek, A. Van, and Verbeke, O.</i> Measurements of the pressure dependence of liquid normal hydrogen	21
— and <i>Verbeke, O.</i> The variation of the density of liquid nitrogen and liquid oxygen as a function of pressure	79
—, <i>Zink, H., and Paemel, O. Van.</i> Viscosity measurements in liquefied gases	210
<i>Johnson, C. E.</i> The Mössbauer effect	129
<i>Kaganovskii, A. Ya., and Mikhailov, N. N.</i> Carbon resistance thermometers for low temperatures	98
<i>Kanda, E., and Ohtsubo, A.</i> Use of a recording fluxmeter for adiabatic demagnetization experiments	339
<i>Kashirin, V. B., and Shvets, A. D.</i> A magnetic suspension for low temperature studies	276
<i>Khaikin, M. S.</i> A frequency modulation method for studying the surface impedance of metals	146
<i>Khotkevich, V. I., Pervakov, V. A., and Genkin, Ya. E.</i> A low temperature press	281
<i>Knöner, R., and Bewilogua, L.</i> The thermosiphon as a nitrogen cryostat for operation in the horizontal reactor channel	46
<i>Korolyuk, A. P., and Galkin, A. A.</i> An apparatus for studying ultrasonic absorption in metals at low temperatures	48
<i>Kreitman, M., Baltensperger, W., Olsen, J. L., and Daunt, J. G.</i> The variation of critical current in superconducting alloys with field direction	212
<i>Kropschot, R. H., and Arp, V.</i> Superconducting magnets	1
<i>Lazarev, B. G., Shvets, A. D., and Esel'son, B. N.</i> The production of temperatures below 1°K by pumping liquid helium vapour using adsorption pumps	279
Liquefier for producing <i>para</i> -hydrogen and catalysts for the <i>ortho</i> - <i>para</i> conversion of hydrogen, a: <i>R. A. Buyanov, A. G. Zel'dovich, and Yu. K. Pilipenko</i>	143

Liquid helium-II, thermomechanical pressure measurements in: <i>S. M. Bhagat and P. R. Critchlow</i>	39	Neganov, B. S., Parfenov, L. B., Goncharov, I. N., and Gromova, I. I. An electromagnet with superconducting windings	363
— helium cryostat for X-ray diffraction studies: <i>K. L. Chopra</i>	167	Neon-helium mixtures, continuously working plant for the separation of: <i>L. Bewilogua</i>	290
— helium level indicator, a: <i>A. E. Rovinskii</i>	115	Nickel-zinc fluosilicate, thermal and magnetic properties of: <i>J. S. Hill, H. Meyer, and J. H. Milner</i>	170
— nitrogen, an automatic arrangement for supplying a space with: <i>L. I. Roizen and V. K. Gannus</i>	145	<i>Nihoul, J., and Biermans, F.</i> A simple and continuous level indicator for liquefied gases	243
— nitrogen and liquid hydrogen, measurement and automatic maintenance of: <i>Yu. I. Nechaev</i>	175	Nitrogen Dewars and nitrogen shielded helium Dewars, explosive boiling in: <i>L. Rinderer and F. Haenssler</i>	288
— nitrogen and liquid oxygen as a function of pressure, the variation of the density of: <i>A. Van Itterbeek and O. Verbeke</i>	79	Nuclear rocketry, cryogenic engineering in: <i>F. J. Edeskuty and E. F. Hammel</i>	193
— nitrogen, new refrigeration cycle for the production of: <i>S. C. Collins and R. W. Hughes</i>	43	Ohtsubo, A., and Kanda, E. Use of a recording fluxmeter for adiabatic demagnetization experiments	339
Lithium and dilute lithium-magnesium alloys, the effect of the Martensitic transformation on the electrical resistance of: <i>J. S. Dugdale and D. Gugan</i>	103	Olsen, J. L. Superconductivity of cadmium isotopes	356
Lock J. M. Towards superconductive computers	65	—, Daunt, J. G., Kreitman, M., and Balternsperger, W. The variation of critical current in superconducting alloys with field direction	212
Low temperature press, a: <i>V. I. Khotkevich, V. A. Pervakov, and Ya. E. Genkin</i>	281	Paemel, O. Van, Itterbeek, A. Van, and Zink, H. Viscosity measurements in liquefied gases	210
— temperature studies, a magnetic suspension for: <i>A. D. Shvets and V. B. Kashirin</i>	276	Pandorf, R. C., Chen, C. Y., and Daunt, J. G. Heat transport through carbon radio resistors at low temperatures and their use in conjunction with superconducting thermal valves	239
McGee, H. A., Jr., and Martin, W. J. Cryochemistry	257	Parfenov, L. B., Goncharev, I. N., Gromova, I. I., and Neganov, B. S. An electromagnet with superconducting windings	363
McNutt, J. D., Bohm, H. V., and Zimmerman, J. E. A magnetic refrigerator employing superconducting solenoids	153	Peacock, R. V. Tolerances associated with the operation of the Crowe storage cell in the coincident current mode	88
Magnetic refrigerator employing superconducting solenoids, a: <i>J. E. Zimmerman, J. D. McNutt, and H. V. Bohm</i>	153	Pervakov, V. A., Genkin, Ya. E., and Khotkevich, V. I. A low temperature press	281
Maimoni, A. Electrical resistance of aluminium at low temperatures	217	Pilipenko, Yu. K., Buyanov, R. A., and Zel'dovich, A. G. A liquefier for producing para-hydrogen and catalysts for the ortho-para conversion of hydrogen	143
Martin, W. J., and McGee, H. A., Jr. Cryochemistry	257	— and Zel'dovich, A. G. A hydrogen liquefier with an output of 50 l./hr of liquid hydrogen	101
Measurement of thermal conductivity at low temperatures by a non-stationary method: <i>E. Donth and C. Gladun</i>	223	Pressure dependence of liquid normal hydrogen. measurements of the: <i>A. Van Itterbeek and O. Verbeke</i>	21
Melting pressure equation for the hydrogens: <i>R. D. Goodwin</i>	353	Production of temperatures below 1°K by pumping liquid helium vapour using adsorption pumps, the: <i>B. N. Esel'son, B. G. Lazarev, and A. D. Shvets</i>	279
Mendelssohn, K., and Bhagat, S. M. Isothermal flow of liquid helium-II in wide capillaries	34	P-type germanium between 0.2° and 4°K, thermal conductivity of: <i>J. A. Carruthers, J. F. Cochran, and K. Mendelssohn</i>	160
—, Carruthers, J. A., and Cochran, J. F. Thermal conductivity of P-type germanium between 0.2° and 4°K	160	Recording fluxmeter for adiabatic demagnetization experiments, use of a: <i>Akio Ohtsubo and Eizo Kanda</i>	339
—, Rowell, P. M., and Calverley, A. Some thermal and magnetic properties of tantalum, niobium, and vanadium at helium temperatures	26	Reichel, J., and Bewilogua, L. Studies on desorption cryostats	180
Meyer, H., Milner, J. H., and Hill, J. S. Thermal and magnetic properties of nickel-zinc fluosilicate	170	Resistance thermometer measurements using a digital computer. the calculation of temperature differences from: <i>L. J. Challis</i>	23
Mikhailov, N. N., and Kaganovskii, A. Ya. Carbon resistance thermometers for low temperatures	98		
Milner, J. H., Hill, J. S., and Meyer, H. Thermal and magnetic properties of nickel-zinc fluosilicate	170		
Molenda, P. J., and Buchhold, T. A. Surface electrical losses of superconductors in low frequency fields	344		
Mössbauer effect, the: <i>C. E. Johnson</i>	129		
Nechaev, Yu. I. Measurement and automatic maintenance of liquid nitrogen and liquid hydrogen	175		

Rinderer, L., and Haenssler, F. Explosive boiling in nitrogen Dewars and nitrogen shielded helium Dewars	288	65
Roder, H. M., Goodwin, R. D., Weber, L. A., and Diller, D. E. The vapour pressure of 20° K equilibrium hydrogen	236	344
—, Weber, L. A., Goodwin, R. D., and Diller, D. E. The densities of saturated liquid hydrogen.	81	146
Roizen, L. I., and Gannus, V. K. An automatic arrangement for supplying a space with liquid nitrogen	145	26
Rovinskii, A. E. A liquid helium level indicator	115	93
Rowell, P. M., Calverley, A., and Mendelsohn, K. Some thermal and magnetic properties of tantalum, niobium, and vanadium at helium temperatures	26	230
Saturated liquid hydrogen, the densities of: R. D. Goodwin, D. E. Diller, H. M. Roder, and L. A. Weber	81	292
Shvets, A. D., Bereznyak, N. G., and Esel'son, B. N. An apparatus for obtaining temperatures down to 0.3 K by using helium-3.	361	46
Esel'son, B. N., and Lazarev, B. G. The production of temperatures below 1° K by pumping liquid helium vapour using adsorption pumps and Kashirin, V. B. A magnetic suspension for low temperature studies	279	334
Sikora, P., Arp, V., Wilson, J. H., and Winrich, L. Thermal expansion of some engineering materials from 20 to 293° K	276	359
Simple and continuous level indicator for liquefied gases, a: F. Biermans and J. Nihoul	230	48
Smith, R. V., Strobridge, T. R., and Stewart, R. B. Current trends and prospects in cryogenics	243	236
Solid and liquid neon, the vapour pressure of: E. R. Grilly	321	212
Soskin, M. S., Babenko, V. P., and Brodin, M. S. A cryostat for dispersion measurements at low temperatures	226	21
Specific heat at constant volume of para-hydrogen at temperatures from 15 to 90° K and pressures to 340 atm: B. A. Younglove and D. E. Diller heat of saturated liquid para-hydrogen from 15 to 32° K: B. A. Younglove and D. E. Diller	365	79
Spectroscope for studying spin-lattice relaxation in paramagnetic substances in the temperature range 2–60° K, a: G. M. Zverev	283	210
Stewart, R. B., Smith, R. V., and Strobridge, T. R. Current trends and prospects in cryogenics	273	91
Strelkov, P. G., and Voronel, A. V. A method for measuring the heat capacity of condensed gases above their boiling point	321	236
Strobridge, T. R., Stewart, R. B., and Smith, R. V. Current trends and prospects in cryogenics	91	81
Superconducting magnets: R. H. Kropschot and V. Arp	321	292
— solenoids, some aspects of the design of: M. Wood	1	230
Superconductive computers, towards: J. M. Lock	297	
Surface electrical losses of superconductors in low frequency fields: T. A. Buchhold and P. J. Molenda		
— impedance of metals, a frequency modulation method for studying the: M. S. Khaikin		
Tantalum, niobium, and vanadium at helium temperatures, some thermal and magnetic properties of: A. Calverley, K. Mendelsohn, and P. M. Rowell		
Thermal expansion of metals at low temperatures, the measurement of: K. Andres		
— expansion of some engineering materials from 20 to 293° K: V. Arp, J. H. Wilson, L. Winrich, and P. Sikora		
— expansion of vanadium, niobium, and tantalum at low temperatures: G. K. White		
Thermosiphon as a nitrogen cryostat for operation in the horizontal reactor channel, the: L. Bewilogua and R. Knöner		
Thin films of tin on single crystal substrates, a study of the orientation of: A. E. Curzon		
Tkachenko, V. K., and Filimonov, A. I. A gasifier for obtaining pressures up to 100 atm using liquid helium		
Ultrasonic absorption in metals at low temperatures, an apparatus for studying: A. A. Galkin and A. P. Korolyuk		
Vapour pressure of 20° K equilibrium hydrogen, the: L. A. Weber, D. E. Diller, H. M. Roder, and R. D. Goodwin		
Variation of critical current in superconducting alloys with field direction, the: J. G. Daunt, M. Kreitman, W. Baltensperger, and J. L. Olsen		
Verbeke, O., and Itterbeek, A. Van. Measurements of the pressure dependence of liquid normal hydrogen		
— and Itterbeek, A. Van. The variation of the density of liquid nitrogen and liquid oxygen as a function of pressure		
Viscosity measurements in liquefied gases: A. Van Itterbeek, H. Zink, and O. Van Paemel		
Voronel, A. V., and Strelkov, P. G. A method for measuring the heat capacity of condensed gases above their boiling point		
Weber, L. A., Diller, D. E., Roder, H. M., and Goodwin, R. D. The vapour pressure of 20° K equilibrium hydrogen		
—, Goodwin, R. D., Diller, D. E., and Roder, H. M. The densities of saturated liquid hydrogen.		
White, G. K. Thermal expansion of vanadium, niobium, and tantalum at low temperatures		
Wilson, J. H., Winrich, L., Sikora, P., and Arp, V. Thermal expansion of some engineering materials from 20 to 293° K		
Winrich, L., Sikora, P., Arp, V., and Wilson, J. H. Thermal expansion of some engineering materials from 20 to 293° K		

Wood, M. Some aspects of the design of superconducting solenoids	297	
Yates, B., and Hoare, F. E. Small scale hydrogen liquefaction	84	
Younglove, B. A., and Diller, D. E. The specific heat at constant volume of <i>para</i> -hydrogen at temperatures from 15 to 90° K and pressures to 340 atm	348	
— and Diller, D. E. The specific heat of saturated liquid <i>para</i> -hydrogen from 15 to 32° K	283	
Zel'dovich, A. G., and Pilipenko, Yu. K. A hydrogen liquefier with an output of 50 l./hr of liquid hydrogen	101	
—, Pilipenko, Yu. K. and Buyanov, R. A. A liquefier for producing <i>para</i> -hydrogen and catalysts for the <i>ortho-para</i> conversion of hydrogen		143
Zimmerman, J. E., McNutt, J. D., and Bohm, H. V. A magnetic refrigerator employing superconducting solenoids		153
Zink, H., Paemel, O. Van, and Itterbeek, A. Van. Viscosity measurements in liquefied gases		210
Zverev, G. M. A spectroscope for studying spin-lattice relaxation in paramagnetic substances in the temperature range 2–60° K		273

Page key

Pages 1–64	September 1961
Pages 65–128	December 1961
Pages 129–192	March 1962
Pages 193–256	June 1962
Pages 257–320	September 1962
Pages 321–384	December 1962

Gaps in pagination have been caused by the deletion of advertisements which appeared in the original volume.

